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Consumer Attitudes and Practices Related to *Salmonella Enteritidis*

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Consumer Knowledge

Pathogen	Aware / Food
• <i>Salmonella</i> spp.	• 80% / 54%
• <i>C. Botulinum</i>	• 75% / 23%
• <i>Trichinella</i> sp.	• 41% / 26%
• Hepatitis A	• 38% / 12%
• <i>Staphylococcus a.</i>	• 26% / 1%
• <i>Listeria m.</i>	• 10% / 1%

Altekruse et al, 1998

Consumers Knowledge of *Salmonella*

- 74% in Nationwide sample correctly associated *Salmonella* with poultry and eggs
- 84% in California survey have heard that eggs may contain bacteria that causes illness

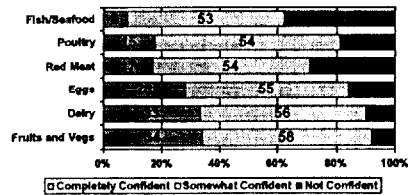
Wilkinson et al, 1992; Reynolds, 1997

Consumer Views : Source of Foodborne Illness

- 27% Mishandling poor sanitation
- 19% Spoiled (expired) food
- 18% Improper cooking
- 13% Germs (4% *Salmonella*, 2% *E Coli*)
- 7% Food (Chicken 3%, beef 2%)

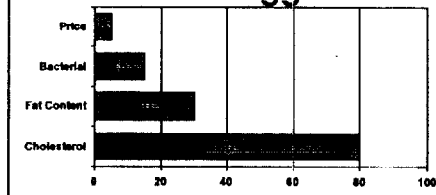
FMI, 2000

Confidence in Safety



Bruhn & Schutz, 1999

Reason for Purchasing Fewer Eggs



Bruhn & Schutz, 1999

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Consumer Egg Handling

- Most refrigerate eggs (97%-98%)
- Some leave eggs at room temp. during meal preparation (22%)
- Most never use cracked egg (79%)

Reynolds, 1997

Refrigerated Foods Too Warm

- Sample :
121 households
71% had college degrees
- 9% Refrigerated food > 45 F
- 23% Refrigerated food 42-45 F

Audits Intern 1999

Why Refrigerators are Too Warm

- 70% Education
"Was not aware of standard"
- Motivation
20% "Didn't think it was important"
10% "Confused by multiple recommendations"

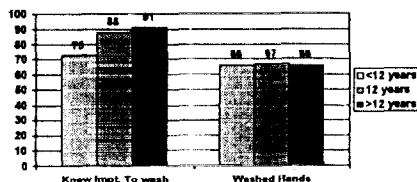
Audits Intern 1999

Frequency of "Always" Washing

	Before Handling Eggs	After Handling Eggs
Wash Hands	53%	48%
Wash Prep. Area	87%	82%

Reynolds, 1997

Knowledge and Practices



Altekruse et al, 1996

Why Consumers Don't Wash Hands

- 59% Education
"Was not aware I should"
- Motivation
19% "Didn't think it was important"
9% "Willing to take risk"
6% "Takes too much time"
6% "Always done it this way"

Why Cross Contamination Occurs

- 65% Education
 - “Not aware that contamination occurred”
- Motivation
 - 16% “Didn’t think it was important”
 - 10% “Willing to take risk”
 - 3% “Always done it this way”
 - 6% “Don’t agree - guideline”

Audits Intern. 1999

Use raw eggs in salads, desserts, and drinks

- 72% Never
- 18% Rarely
- 10% Sometimes

Bruhn & Schutz, 1999

Consumption of Raw Eggs

- 15% Eaten in last 30 days
 - 12% Non-Hispanic, 24% Hispanic
- Most common foods
 - Cookie dough, Cake batter
 - Caesar salad
 - Drinks

Reynolds, 1997

Egg Cooking

Many do not thoroughly cook eggs

- 24% Sunny side up
- 34% Over Easy
- 28% Over medium
- 17% Over well

Reynolds, 1997

Adequacy of Cooking

- 19% Finished Temp. Too Low
 - <140F Comm. precooked foods
 - <145 F Meat, fish & seafood
 - <155 F Ground beef and pork
 - <165 F Casseroles, leftovers

Audits Intern. 1999

Taste Leftovers to See If They are Safe

- 26% Always
- 21% Sometimes
- 18% Rarely
- 35% Never

Bruhn and Schutz, 1999

Response to Safe Handling Labels on Eggs

- 41% almost always, 24% sometimes and 33% seldom or never read labels
- 86% believed labels would be helpful
- 19% would change behavior as a result of label information

Reynolds, 1997

Comments: Safe Handling Labels

- 1999 California Focus Group Study
- Print large enough for easy reading
- Use contrasting color
- Messages should vary
- Be innovative, use humor

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Handling Labels

- Icons suggested by consumers
- Words and drawings conveyed 9 messages
- Each carton contained 4 messages, 2 were identical, 2 different.

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Statements Most Frequently Remembered

- 52%-66% Keep Refrigerated
- 57%-70% Wash Hands Before and After
- 42% Don't Eat Raw Eggs
- 42% Don't Use Cracked Eggs
- 41% Use Within 3 weeks of Sell by Date

Bruhn

Different Behavior Reported After Seeing Labels

- Cooking eggs firm increased from 48% to 70%
- Eating raw eggs decreased from 31% to 15%
- Small increase in washing utensils
- No change in hand washing

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Consumer Suggestions

- Guidelines alone not as effective as comprehensive educational program
- Some recommendations not believed
- Explain why guidelines are important
- Develop egg safety programs for school children

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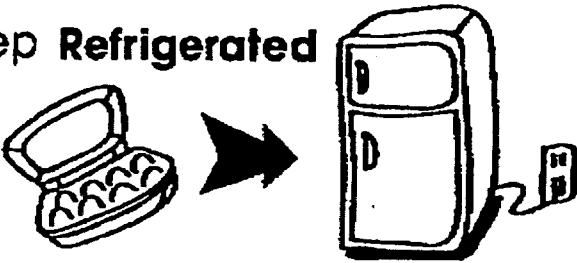
Consumer Information Needs

- Seriousness of SE
- Who is at greatest risk
- Why a healthy food can carry a dangerous bacteria
- Target messages to practices of specific cultural groups

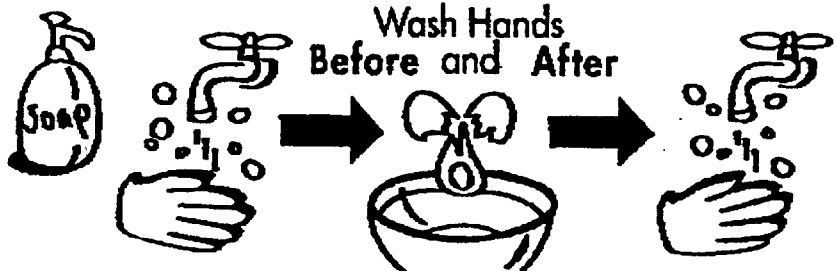
Consumer Information Needs: Ways to Reduce Risks

- Personal and Kitchen sanitation - why use soap
- Refrigeration (retail / consumer)
- Reason for thorough heating
- Provide pasteurized shell egg for safer raw egg use.
- How to evaluate safety in food service

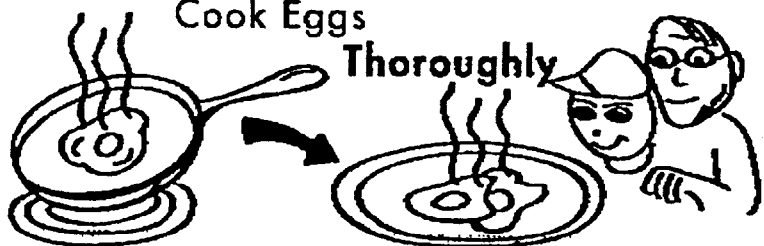
Keep Refrigerated

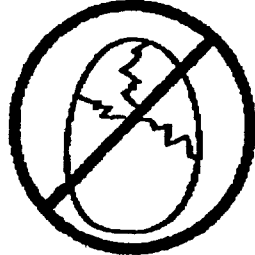


Wash Hands Before and After



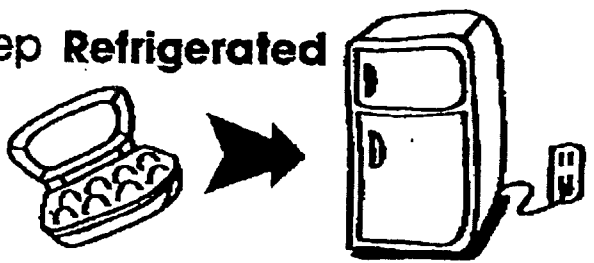
Cook Eggs Thoroughly



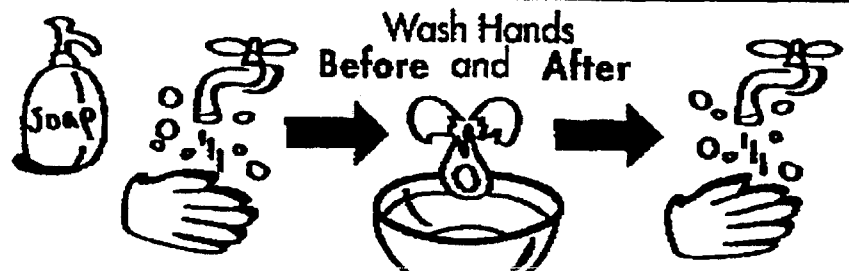


Don't Use Cracked Eggs

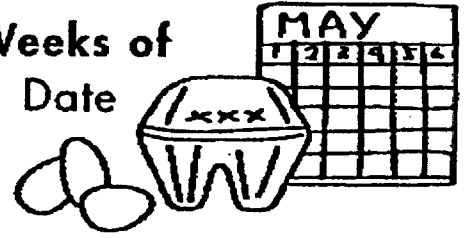
Keep Refrigerated

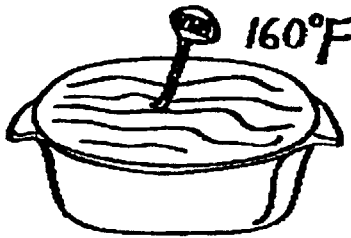


Wash Hands Before and After



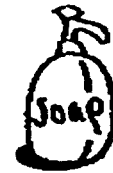
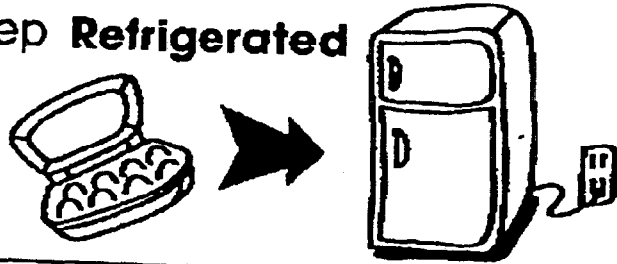
Use Within 3 Weeks of Sell by Date



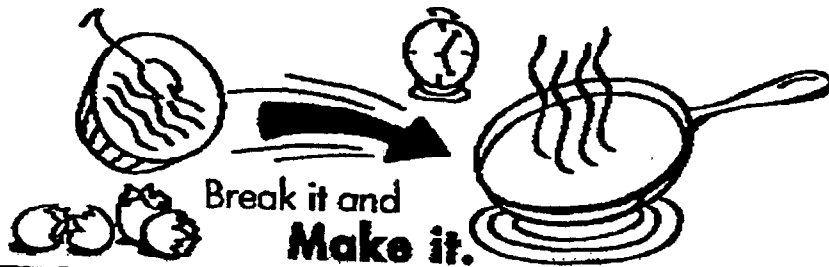


160°F Cook Thoroughly

Keep Refrigerated



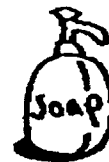
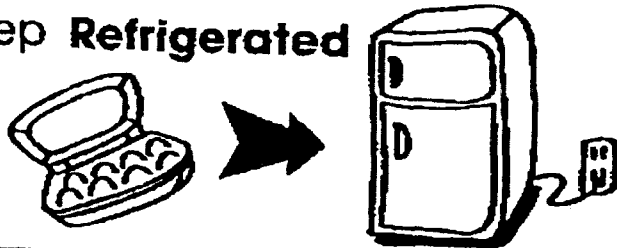
Wash Hands
Before and After



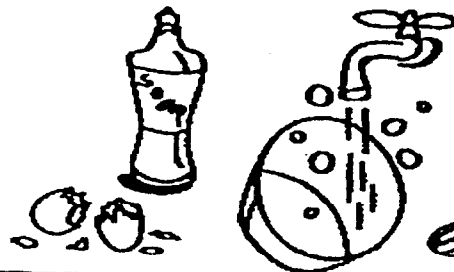
Don't
Eat
Raw
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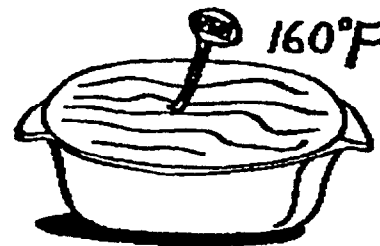
Keep Refrigerated



Wash Hands
Before and After



Wash Dishes
Thoroughly



Cook
Thoroughly